

# LONG-LIVED AIRBORNE GAMMA-EMITTING PARTICULATE RADIOACTIVITY IN THE UNITED STATES

Robert Lowry

National Analytical Radiation Environmental Laboratory  
U.S. Environmental Protection Agency  
540 South Morris Avenue  
Montgomery, Alabama 36115

The Environmental Protection Agency operates the RadNet air monitoring network. RadNet is the successor to the Environmental Radiation Ambient Monitoring System (ERAMS), which was a consolidation by EPA of several radiation monitoring networks begun in the 1950's by the Public Health Service. The current network consists of high volume air samplers at fixed locations in 134 population centers in all 50 states, Washington DC, and Puerto Rico.

Sampling is almost continuous at about one cubic meter per minute, except for filter changes once or twice a week. The monitoring systems are equipped with near-real-time gamma and beta detectors that transmit data to Montgomery every hour. Exposed filters are mailed to the National Analytical Radiation Environmental Laboratory (NAREL) where they are screened for gross beta activity, with further analysis if the screening action level is exceeded.

At the end of each year, all of the polyester filters collected from each station are composited by dry ashing in a muffle furnace. For a location where there were no gaps in sampling, the total air volume represented by the ash is over 500,000 cubic meters. Historically, the composites have been analyzed for Plutonium and Uranium. For this study, gamma spectrometry on the entire sample was performed prior to removing aliquots for the other analysis. The very large air volume facilitates measurement of trace radionuclides that are not normally detectable by other monitoring networks.

Nationwide annual average airborne concentrations and their variability will be presented for:

- the cosmogenic nuclides Be-7 and Na-22
- radon progeny Pb-210
- suspended surface soil nuclides K-40, Cs-137, and short lived radon progeny supported by their long lived parents

Information on how to find measurement results for individual locations in EPA's Envirofacts database will also be presented.

lowry.robert@epa.gov

Michelle Owens, NAREL, performed most of the gamma spectrometry measurements for this study